



Rural Electrification Workshop
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Rural Electrification Policies in Cambodia

Presented by

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I. Introduction

- Area: 181,035 km²
- Total Population: about 14 million
- Number of Provinces: 24
- Number of Districts: 159
- Number of Communes: 1,417
- Number of Villages: 14,073
- By the end of 2012:
 - Number of licenses issued: 312
 - Number of Households Electrified: about 40% (900,982HHs)
 - Number of Villages Electrified: 49.65%



II. Target of the Royal Government of Cambodia (RGC) on Rural Electrification

RGC, in its pursuit to reduce poverty, improve the standard of living and foster economic development of the rural areas, and in the framework to accelerate development of rural electrification, **has set a two-step target in rural electrification:**

- (i) All the villages in the Kingdom of Cambodia have access to electricity of any type by the year 2020; and*
- (ii) At least 70 % of all households in the Kingdom of Cambodia have access to grid-quality electricity by the year 2030.*



III. Electricity Sector in Cambodia

- 1. **Electricité du Cambodge (EDC):**

- EDC is a government owned company and has got a consolidated license comprising of Generation, National Transmission License and Distribution licenses. It supplies electricity to Phnom Penh area, 13 provincial towns and a number of locations near Vietnam Border.
- EDC either owns the transmission lines or has transmission agreements with transmission licensees operating HV lines to exclusively use the lines.
- EDC is also developing MV networks in many provinces. It is expected to expand the MV network in other provinces also as and when grid supply is available and funds are arranged.

2. Other Licensees:

- There are a large number of private entrepreneurs in electricity sector providing generation, transmission and/or distribution services.
- The number of licensees, other than EDC, having different types of license by end 2012 is given below:

No.	Type of License	Number of Licensees in operation
1	Generation	16
2	Special Purpose Transmission	7
3	Distribution	82
4	Retail	1
5	Consolidated (Gen +Dist)	198
6	Consolidated (SPTL + Dist)	7
	Total	312

IV. Strategy and Plan for Development of Rural Electrification

1 The effort of RGC in the development of power sector:

- Development of electricity generation plants using indigenous, hydro resources and generation from imported coal, renewable energy sources, import electricity from neighboring countries of Vietnam, Thailand and Lao PDR;
- To accelerate the construction of electricity transmission system and sub-transmission systems by EDC and other private licensees.

2 Strategy for Rural Electrification Development:

2.1 Strategy for resolution of electricity supply to rural areas.

- Supply from the National Grid;
- Supply by mini-grid;
- Supply by stand-alone system.



2.2 Strategy for the distribution network development in rural areas:

- Encourage existing licensees to make investment for expansion of their distribution areas; and
- If private licensees do not come up to supply electricity in an grid extension area, EDC shall have the obligation to develop distribution infrastructures to supply electricity in that grid extension area.

3 Mobilization of fund for Development of Rural Electrification in Cambodia 2011-2030:

1. The major challenge is the investment funds.
2. Possible sources:
 - EDC's participation in development of rural electrification from its budget;
 - RGC's fund for assistance in development of rural electrification;
 - Investment by private service providers;
 - Direct participation by electricity consumers;
 - Loan from local banks;
 - Soft loan from development banks;
 - Grant from other countries.

V. Establishment, objectives, management, funding and mandate of REF

1. Establishment of REF:

- RGC issued the Royal Decree for establishment of REF in 2004, to accelerate the development of electric power supply in rural areas in Cambodia.
- On 22 August 2012, RGC issued new Royal Decree on amendment of some articles of the old Royal Decree to integrate REF with EDC.
- Royal Decree clearly stated that REF shall provide assistance for social work in power sector in the rural areas and shall have separate accounts.

2. The objectives of REF

- To promote equitable rural electrification coverage by facilitating the population's access to electricity at affordable price for economic, social and household uses, thus contributing to poverty reduction.
- To promote and encourage private sector to participate in providing sustainable rural electrification services; in particular the exploitation of and economic application of technically and commercially well proven new and renewable energy technologies.

VI. REF Program

1 REF Program in 2008-2011

a) Provide assistance to licensees for adding new consumers:

REF provided grant assistance of USD 45 per HH newly connected to electricity licensees in order to encourage them to expand their electricity network to supply electricity to rural HHs.

b) Assist rural HHs in installing SHS living in remote areas:

- REF bulk purchases 12,000 units of SHS with tax exemption from government and sell to the rural HHs in the remote areas at cost subsidized by USD 100 to be repaid in instalments without interest in order to allow these HHs to have benefit of electricity.
- The transportation and installation fees are borne by REF.
- The charges for re-payment in instalments within 4 years is borne by REF.
- The maintenance fee for the 1st year is borne by the supplier/REF.
- The maintenance fee from the 2nd year until repayment in full is borne by REF but purchaser has to be responsible for the defective parts.
- After the purchaser has paid the installments in full, the SHS will become the property of the purchaser.

2 On going Program of REF after integration with EDC: 2012 to present

- (1)- SHS program,
- (2)- Power to the Poor (P2P) program,
- (3)- Provide assistance to improve existing and/or develop new electricity infrastructure in rural areas.

(1)- SHS program:

- REF has programmed for more 4,000 units of SHS.
- Use the same mechanism as above.

(2)- Power to the Poor (P2P) Program

Provide up to USD 120 per HH, interest free loan to meet expenses for connection, deposit, meter, wires from meter to house, and in-house wiring fees, to be repaid in 36 monthly installments without interest.



(3)- Provide Assistance to Develop Electricity Infrastructure in Rural Areas

- Facilitate the private licensees to access fund for investing on electricity infrastructure in rural areas.
- The criterion for implementation of this program is formulated for 3 different types of area considering the density of population as follows:

Area No. 1: Area with high density of population having economic efficiency

EDC through REF will provide the guarantee on loan borrowed by licensees from the local banks for investment on electricity infrastructure in rural areas.

Area No. 2: Area with medium density of population, where doing electricity business may not be profitable if he has to pay interest on the investment capital

EDC through REF will provide interest free assistance up to USD 100,000 per project for investment on LV electricity infrastructure in rural areas connected from the national grid.

Area No. 3: Area with low density of population, where doing electricity business is not viable unless part of the infrastructure cost is provided as grant

EDC through REF will provide assistance up to USD 100,000 per project consisting of (1)- up to 30% of cost as grant (2)- balance as interest free assistance for investment on electricity infrastructure in rural areas connected from the national grid.

VII. Key lessons learned and Recommendation

The key lessons learned are as follows:

1. Participation by public and private entrepreneurs to overcome fund constraints and rapid electrification.
2. Supply to rural areas by grid extension is preferred, for remote areas mini-grid systems and for other further remote areas stand-alone system is encouraged.
3. For areas where electricity supply is not viable, subsidy is required. The amount of subsidy depends on degree of non-viability.
4. A well designed M&E framework is essential for properly assessing the real achievements of a project.
5. To make private sector investments happen in Renewable Energy in rural areas, the basic policy and regulatory enabling environment should be complemented with careful designed and well targeted financing support, technical assistance and capacity building.

Recommendation:

Myanmar may formulate policy, strategy and plan for development of rural electrification similar to Cambodia to the extent found suitable.

VIII. Some of Electricity Projects

Kamchay Hydro Power Plant

- Installed Capacity: 194.1 MW.
- Reservoir.
- Location: Kampot Province.
- Put in Operation: December 2011.



Kirirom III Hydro Power Plant



- Installed Capacity: 18 MW;
- Reservoir;
- Location: Koh Kong Province;
- Put in Operation: April 2012.



Atay Hydro Power Plant

- Installed Capacity: 120 MW;
- Reservoir;
- Location: Pursat Province;
- Operation Date: mid of 2013.



Tatay Hydro Power Plant



- Installed Capacity: 246 MW;
- Reservoir;
- Location: Koh Kong Province;
- Operation Date: 2014.



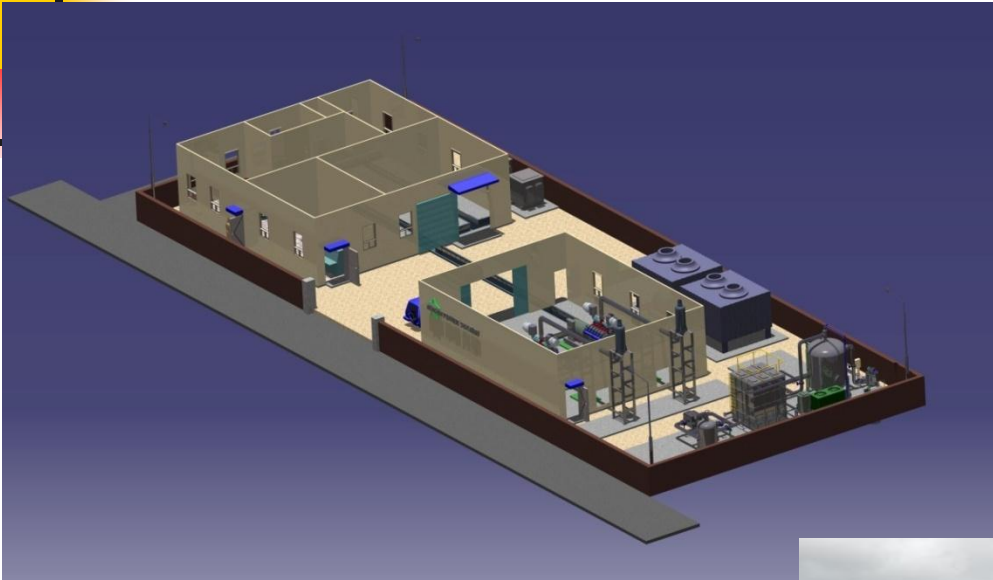
Lower Reussey Chrom Hydro Power Plant



- Installed Capacity: 338 MW;
- Reservoir;
- Location: Koh Kong Province;
- Operation Date: 2014.



Landfill Biogas Power Plant (Waste)



- Installed Capacity: 1 MW
- Location: Steung Meanchey, Phnom Penh
- Operation Date: 2013.



Phnom Penh Sugar Power Plant (Biomass: Sugar Cane)



- Installed Capacity: 16 MW electric cogeneration plant in the acquired 20,000 hectare;
- Location: Kampong Speu;
- Operation Date: January 2013;
- <http://www.lypgroup.com/plantation.php>



KAMADHENU VENTURES (Biomass: Sugar Cane)



- Installed Capacity: 20 MW;
- Location: Kratie;
- Operation Date: 2013.



Sihanouk Ville Coal Power Plant N.1



- Installed Capacity: 2 x 50 MW;
- Location: Sihanouk Province;
- Operation Date: 2013.



Sihanouk Ville Coal Power Plant N.2

Sihanoukville 7 × 135MW coal-fired power plant aerial view



- Phase 1: 2 x 135 MW;
- Location: Sihanouk Province;
- Operation Date: 2014



Phnom Penh-Battambang Transmission line Project



- 3 Substations
- 302 km of 230 kV line
- In service April 2012



Distribution 22 kV line Project



Distribution Line in Senmonorom (Heaven City)



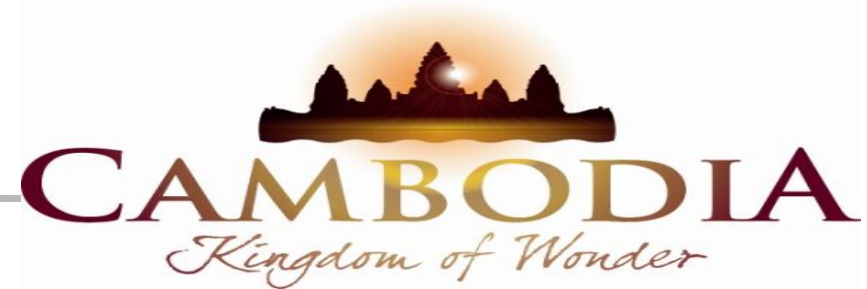
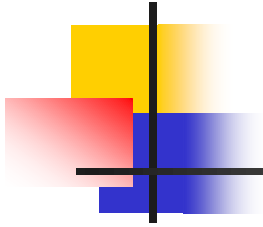
Distribution Line to Kravagn Mountains



Distribution in Rubber plantation in Kg Cham



AVR using for
increasing voltage in
long distance



Thank you very much

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